WHAT IS CLAIMED IS:

1. An optical unit comprising:

a light amount adjustment unit having an optical member which receives a light beam from an object, a light amount adjustment mechanism to adjust a light amount of the light beam received by the optical member, a light amount adjustment actuator unit which drives the light amount adjustment mechanism, and a first case which accommodates the optical member, the light amount adjustment mechanism, and the light amount adjustment actuator unit; and

a lens unit having a lens group which is movably arranged to obtain a predetermined object image from the light beam whose light amount is adjusted by the light amount adjustment mechanism, a lens driving actuator unit which drives the lens group, and a second case which accommodates the lens group and the lens driving actuator unit,

wherein the light amount adjustment unit and lens unit can detachably be coupled through coupling means provided between the first case and the second case.

2. A unit according to claim 1, wherein

the light amount adjustment actuator unit is arranged adjacent to one side of the optical member.

3. A unit according to claim 1, wherein

the optical member includes a reflecting optical member which deflects the light beam incident from the

object.

4. A unit according to claim 2, wherein

the optical member includes a reflecting optical member which deflects the light beam incident from the object.

5. A unit according to claim 4, wherein

the light amount adjustment mechanism is arranged in the light amount adjustment unit on a coupling surface to the lens unit.

6. A unit according to claim 1, wherein

in a state wherein the light amount adjustment unit and the lens unit are integrally coupled, the light amount adjustment actuator unit and the lens driving actuator unit are arranged along a linear region that is substantially parallel to a direction of an optical axis of the lens group.

7. A unit according to claim 4, wherein

in a state wherein the light amount adjustment unit and the lens unit are integrally coupled, the light amount adjustment actuator unit and the lens driving actuator unit are arranged along a linear region that is substantially parallel to a direction of an optical axis of the lens group.

8. A unit according to claim 1, wherein

the second case has, at a coupling portion to be coupled to the first case, positioning members to position the optical member accommodated in the first

case.

9. A unit according to claim 6, wherein

the second case has, at a coupling portion to be coupled to the first case, a positioning member to position the optical member accommodated in the first case.

10. A unit according to claim 8, wherein

the positioning member provided in the second case also serves as a positioning member between the cases to position the first case and the second case.

11. A unit according to claim 10, wherein

the positioning member comprises a projecting portion which projects along a direction of an optical axis, the first case has an insertion portion which receives the projecting portion, and the optical member has an engaging portion which engages with the projecting portion inserted into the insertion portion.

12. An optical unit comprising:

a light amount adjustment unit having an optical member which receives a light beam from an object, a light amount adjustment mechanism to adjust a light amount of the light beam received by the optical member, and a first case which accommodates the optical member and the light amount adjustment mechanism;

a lens unit having a lens group which is movably arranged to obtain an object image from the light beam whose light amount is adjusted by the light amount

adjustment mechanism, and a second case which accommodates the lens group;

coupling portion, arranged between the first case and the second case, for detachably coupling the light amount adjustment unit and the lens unit; and

a positioning member arranged at a coupling portion of the second case so as to position the optical member accommodated in the first case when the first case and the second case are coupled by the coupling portion.

13. An electronic camera having an optical unit of claim 1.

14. An electronic camera having an optical unit of claim 4.

15. An electronic camera having an optical unit of claim 6.

16. An electronic camera having an optical unit of claim 9.

17. An electronic camera having an optical unit of claim 12.

18. A light amount adjustment actuator unit comprising:

an actuator case;

a first actuator comprising a first rotor unit and a first stator unit, which are accommodated and held in the actuator case; and

a second actuator comprising a second rotor unit

and a second stator unit, which are accommodated and held in the actuator case to be adjacent to the first actuator,

wherein the first stator unit comprises an internal stator member having a magnetic pole portion and an external stator member having a magnetic pole portion,

the second stator unit comprises an internal stator member having a magnetic pole portion and an external stator member having a magnetic pole portion,

the actuator case has a first opening portion to which the internal stator members are to be attached and which is formed in one surface, and second and third opening portions to which the external stator members are to be attached and which are formed in two surfaces perpendicular to the surface having the first opening portion,

the internal stator member of the first stator unit and the internal stator member of the second stator unit are inserted into the actuator case through the first opening portion while the magnetic pole portions are attached to surround a part of an outer surface of a rotor of the first rotor unit and a part of an outer surface of a rotor of the second rotor unit, respectively, and

the external stator member of the first stator unit and the external stator member of the second

stator unit are attached to cover the second and third opening portions, respectively, while the magnetic pole portions are attached to surround the remaining part of the outer surface of the rotor of the first rotor unit and the remaining part of the outer surface of the rotor of the second rotor unit, respectively.

19. A unit according to claim 18, wherein a rear end portion of the internal stator member and a rear end portion of the external stator member in the first stator unit, which are exposed from the actuator case, are magnetically coupled, and a rear end portion of the internal stator member and a rear end portion of the external stator member in the second stator unit, which are exposed from the actuator case, are magnetically coupled.

20. A unit according to claim 18, wherein a holding guide portion to hold the internal stator members are formed in the actuator case.

21. A unit according to claim 18, wherein the internal stator member of the first stator unit and the internal stator member of the second stator unit are attached to an inside of the actuator case while setting rear surface portions close to each other.

22. A unit according to claim 19, wherein the internal stator member of the first stator unit and the internal stator member of the second

stator unit are attached to an inside of the actuator case while setting rear surface portions close to each other.

23. A unit according to claim 18, wherein

a positioning portion to position the external stator member of the first stator unit is formed at the second opening portion of the actuator case, and

a positioning portion to position the external stator member of the second stator unit is formed at the third opening portion of the actuator case.

24. A unit according to claim 20, wherein

a positioning portion to position the external stator member of the first stator unit is formed at the second opening portion of the actuator case, and

a positioning portion to position the external stator member of the second stator unit is formed at the third opening portion of the actuator case.

25. A unit according to claim 23, wherein

each of the positioning portion has a pin shape and is designed to engage with a positioning hole formed in the external stator member and allow thermal caulking.

26. A unit according to claim 18, wherein

at least part of the magnetic pole portions of the internal stator member and external stator member is formed by a stacked core.

27. A unit according to claim 21, wherein

at least part of the magnetic pole portions of the internal stator member and external stator member is formed by a stacked core.

28. A unit according to claim 22, wherein at least part of the magnetic pole portions of the internal stator member and external stator member is formed by a stacked core.

29. A unit according to claim 23, wherein at least part of the magnetic pole portions of the internal stator member and external stator member is formed by a stacked core.

30. A unit according to claim 23, wherein an attachment threaded hole to an external case is formed on at least one of the external stator member of the first stator unit and the external stator member of the second stator unit.

31. A unit according to claim 25, wherein an attachment threaded hole to an external case is formed on at least one of the external stator member of the first stator unit and the external stator member of the second stator unit.

32. A unit according to claim 18, wherein a bearing portion which supports one end of each of rotating shafts of the pair of rotor units is arranged in the actuator case.

33. A unit according to claim 26, wherein a bearing portion which supports one end of each

of rotating shafts of the pair of rotor units is arranged in the actuator case.

34. A unit according to claim 18, wherein in a light amount adjustment device having a shutter mechanism which appropriately closes an opening portion that passes light and a light amount limiting mechanism which limits the amount of light that passes through the opening portion, each of the first and second actuators drives either shutter mechanism or light amount limiting mechanism.

35. An optical unit comprising a light amount adjustment unit including a light amount adjustment actuator unit of claim 18, and a lens unit including a lens group which is arranged to be movable in a direction of an optical axis along a guide shaft and a lens driving actuator unit which drives and moves the lens group to a predetermined position in a direction of an optical axis.

36. A unit according to claim 35, wherein the lens unit has a plurality of lens groups which are arranged to be movable in the direction of the optical axis, and the plurality of lens groups are driven and controlled by a plurality of lens driving actuators arranged in correspondence with the lens groups.

37. A unit according to claim 36, further comprising

a light amount adjustment actuator unit comprising a plurality of light amount adjustment actuators in the light amount adjustment unit, and

a lens driving actuator unit comprising the plurality of lens driving actuators in the lens unit, and

wherein the actuator units are arranged along a linear region that is substantially parallel to the direction of the optical axis of the lens group.

38. A unit according to claim 37, wherein

each of the lens driving actuators comprises a shaft rotatably supported, a rotor which comprises a permanent magnet arranged on one side of the shaft, and a stator including an exciting coil arranged around the rotor, and

the lens driving actuator unit is arranged so that the shafts of the lens driving actuators are arranged in parallel, and portions each having the rotor and the stator are located on opposite sides.

39. A unit according to claim 37, wherein

the shafts of the plurality of light amount adjustment actuators in the light amount adjustment actuator unit are arrayed in a first plane, and

the shafts of the plurality of lens driving actuators in the lens driving actuator unit are arrayed in a second plane parallel to the first plane.

40. A unit according to claim 35, further

comprising

a reflecting optical member which deflects a light beam incident from an object along a first optical axis to a direction of a second optical axis which is perpendicular to the first optical axis.

41. A unit according to claim 39, further comprising

a reflecting optical member which deflects a light beam incident from an object along a first optical axis to a direction of a second optical axis which is perpendicular to the first optical axis.

42. A unit according to claim 41, wherein

a size of the light amount adjustment actuator unit in a direction along the first optical axis and a size of the lens driving actuator unit in the direction along the first optical axis are set to be substantially the same as a size of the reflecting optical member in the direction of the first optical axis.

43. A unit according to claim 41, wherein

the size of the light amount adjustment actuator unit in the direction along the first optical axis and the size of the lens driving actuator unit in the direction along the first optical axis are set to be approximate to each other.

44. An electronic camera having a light amount adjustment actuator unit of claim 18.

45. An electronic camera having an optical unit of claim 41.

46. A stepping motor comprising:

a shaft rotatably supported, a rotor which comprises a permanent magnet arranged on the shaft, and a stator including a magnetization control coil which is arranged adjacent in parallel to an axis of the rotor and a stator core which is magnetization-controlled by the coil,

wherein the stator core in the stator comprises a main stator core which is arranged in the coil and a sub stator core whose yoke portion is magnetically coupled to the main stator core and whose pole portions that apply a rotating magnetic field to the rotor are arranged around the rotor, and

the main stator core is formed by integrally stacking a plurality of core plates and contact-bonding the core plates to each other on both surfaces and is coupled to the yoke portion of the sub stator core by contact bonding.

47. A stepping motor comprising:

a shaft rotatably supported, first and second rotors each of which comprises a permanent magnet arranged on the shaft, and a stator including first and second magnetization control coils which are arranged adjacent in parallel to axes of the first and second rotors and a stator core which is

magnetization-controlled by the first and second coils,

the stator core in the stator comprises first and second main stator cores which are arranged inside the first and second coils, respectively, and first and second sub stator cores whose yoke portions are magnetically coupled to the first and second main stator cores, respectively, and whose pole portions that apply a rotating magnetic field to the first and second rotors are arranged around the first and second rotors, respectively, and

each of the first and second main stator cores is formed by integrally stacking a plurality of core plates and contact-bonding the core plates to each other on both surfaces and is coupled to a corresponding one of the yoke portions of the first and second sub stator cores by contact bonding.

48. A motor according to claim 46, wherein

the magnetization control coil is wound around a bobbin having, at a central portion, a hollow portion capable of receiving the main stator core.

49. A motor according to claim 46, wherein

the sub stator core comprises a one-end-side stator core having the yoke portion magnetically coupled to one end of the main stator core and an other-end-side stator core having the yoke portion magnetically coupled to the other end of the main stator core, and the pole portions of the one-end-side

stator core and those of the other-end-side stator core are arranged to oppose via the rotor.

50. A motor according to claim 47, wherein the sub stator core comprises a one-end-side stator core having the yoke portion magnetically coupled to one end of the main stator core and an other-end-side stator core having the yoke portion magnetically coupled to the other end of the main stator core, and the pole portions of the one-end-side stator core and those of the other-end-side stator core are arranged to oppose via the rotor.

51. A motor according to claim 49, wherein each of the core plates that constitute the main stator core is formed such that one surface of a disk-shaped core member has a projecting portion corresponding to a recess portion of the other surface.

52. A motor according to claim 50, wherein each of the core plates that constitute the main stator core is formed such that one surface of a disk-shaped core member has a projecting portion corresponding to a recess portion of the other surface.

53. A motor according to claim 51, wherein a bearing portion which is arranged on a support wall of one stepping motor to axially support a distal end of a rotating shaft of the other stepping motor that constitutes part of a lens driving actuator unit together with said one stepping motor has the same

shape as that of the core plate which constitutes the main stator core of said one stepping motor.

54. A motor according to claim 46, wherein a through hole extending in a direction parallel to the rotating shaft is formed at a central portion of the main stator core, a boss portion formed on an end plate that protects an outermost stator core is inserted into the through hole, and the boss portion has at a distal end a bearing portion which axially supports a distal end portion of a rotating shaft of the other stepping motor that constitutes part of a stepping motor unit together with said stepping motor.

55. A motor according to claim 47, wherein a through hole extending in a direction parallel to the rotating shaft is formed at a central portion of the main stator core, a boss portion formed on an end plate that protects an outermost stator core is inserted into the through hole, and the boss portion has at a distal end a bearing portion which axially supports a distal end portion of a rotating shaft of the other stepping motor that constitutes part of a stepping motor unit together with said stepping motor.

56. A motor according to claim 54, wherein the bearing portion has a thrust bearing which receives the end portion of the rotating shaft and a biasing member which biases the thrust bearing against the end portion of the rotating shaft.

57. An optical unit having a stepping motor of claim 46 as a lens driving actuator unit in a lens unit.

58. An optical unit having a stepping motor of claim 47 as a lens driving actuator unit in a lens unit.

59. An optical unit having a stepping motor of claim 51 as a lens driving actuator unit in a lens unit.

60. A unit according to claim 57, further comprising

a light amount adjustment mechanism to adjust a light amount of incident light from an object,

a light amount adjustment actuator unit which drives the light amount adjustment mechanism,

a lens group which intervenes in an optical path that passes light whose light amount is adjusted by the light amount adjustment mechanism, and is arranged to be movable in a direction of an optical axis along a guide shaft, and

a lens driving actuator unit which drives and moves the lens group to a predetermined position in the direction of the optical axis, and

wherein the lens driving actuator unit and the light amount adjustment actuator unit are arranged along a linear region that is substantially parallel to the direction of the optical axis of the lens group.

61. A unit according to claim 59, further comprising

a light amount adjustment mechanism to adjust a light amount of incident light from an object,

a light amount adjustment actuator unit which drives the light amount adjustment mechanism,

a lens group which intervenes in an optical path that passes light whose light amount is adjusted by the light amount adjustment mechanism, and is arranged to be movable in a direction of an optical axis along a guide shaft, and

a lens driving actuator unit which drives and moves the lens group to a predetermined position in the direction of the optical axis, and

wherein the lens driving actuator unit and the light amount adjustment actuator unit are arranged along a linear region that is substantially parallel to the direction of the optical axis of the lens group.

62. A unit according to claim 60, wherein

the light amount adjustment mechanism comprises a plurality of light amount adjustment members, and the light amount adjustment actuator unit comprises a plurality of actuators corresponding to the plurality of light amount adjustment members,

shafts of the plurality of actuators are arrayed in one direction in a first plane, and

shafts of motors in the lens driving actuator unit

are arrayed in a second plane parallel to the first plane.

63. A unit according to claim 57, further comprising

a reflecting optical member which deflects a light beam incident from an object along a first optical axis to a direction of a second optical axis which is perpendicular to the first optical axis.

64. A unit according to claim 58, further comprising

a reflecting optical member which deflects a light beam incident from an object along a first optical axis to a direction of a second optical axis which is perpendicular to the first optical axis.

65. A unit according to claim 62, further comprising

a reflecting optical member which deflects a light beam incident from an object along a first optical axis to a direction of a second optical axis which is perpendicular to the first optical axis.

66. A unit according to claim 64, wherein

a size of the light amount adjustment actuator unit in the direction along the first optical axis and a size of the lens driving actuator unit in the direction along the first optical axis are set to be substantially the same as a size of the reflecting optical member in the direction of the first optical

axis.

67. A unit according to claim 64, wherein a size of the light amount adjustment actuator unit in the direction along the first optical axis and a size of the lens driving actuator unit in the direction along the first optical axis are set to be approximate to each other.

68. An electronic camera having an optical unit of claim 63.

69. An electronic camera having an optical unit of claim 65.